



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------|-------------|----------------------|---------------------|------------------|
| 09/608,202 | 06/30/2000 | Harihara Mahesh | CISCP172/2888 | 9305 |
| 22434 | 7590 | 11/20/2003 | EXAMINER | |
| BEYER WEAVER & THOMAS LLP | | | PHAN, TRI H | |
| P.O. BOX 778 | | | ART UNIT | |
| BERKELEY, CA 94704-0778 | | | PAPER NUMBER | |
| | | | 2661 | |
| DATE MAILED: 11/20/2003 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/608,202

Applicant(s)

MAHESH ET AL.

Examiner

Tri H. Phan

Art Unit

2661

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-74 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22, 30-55, 63-70, 73 and 74 is/are rejected.
- 7) ☒ Claim(s) 23-29, 56-62, 71 and 72 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) ✓
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claim 69 is objected to because of the following informality:

In claim 69, line 1, "claim 68.50" is a typographical error; it should be correct to --- claim 68 ---. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 1-5, 9, 30-33, 35-38, 42, 63-66 and 74 are rejected under 35 U.S.C. 102(e) as being anticipated by **Durvaux et al.** (U.S.6,449,243).

- In regard to claims 1, 35 and 74, **Durvaux** discloses in Figs. 1-2 and in the respective portions of the specification about the system, means and method for adapting to the transmission quality of the return channel by setting suitable modulation methods for the network terminations ("*network nodes*") of the communication network ("*access network*"); wherein the head end ("*Head End*"), which is connected to a plurality of network terminations via data and return channels ("*upstream and downstream channels*"), checks for the quality

Art Unit: 2661

measurement (“*channel condition*”) on the return channel (“*first channel*”) and determines the type of modulation of the carrier based on the criteria such as ‘good’, ‘poor’, ‘mediocre’, etc. to adapt to the transmission quality by setting suitable modulation methods (“*dynamically re-configuring*”; For example see Col. 3, Lines 1-7). If the transmission quality is ‘good’ or sufficient, the head end further processes with the original modulation scheme (“*first modulation profile*” or ‘16QAM’), if the transmission quality is ‘poor’, the head end generates the control signal to change its modulation method (“*second modulation profile*” or ‘QPSK’) in response to this poor quality; or if the transmission quality is ‘very good’, the head end generates the control signal which results in an increase in data rate (For example see Figs 1-2; Abstract; Col. 1, Line 59 through Col. 2, Line 21; Col. 2, Line 35 through Col. 3, Line 7). **Durvaux** does disclose that the management center (“*demodulation system*”) at the head end decides which frequency and modulation scheme should use, based on the criteria (For example see Col. 2, Line 65-67), but fails to specifically disclose about the “*first interface*”. However, it is inherent that, as disclosed in Fig. 1, the head end 2 would have an interface (“*first interface*”) for receiving the return signal 4 as claimed in the claimed invention 35.

- Regarding claims 2-5, 9, 36-38 and 42, **Durvaux** further discloses that the head end continues to process the transmission, i.e. ‘16 QAM’ or “*first modulation profile*”, if the quality of the return channel (“*upstream channel*”) is ‘good’; or changes to the ‘QPSK’ (“*second modulation profile*”), if the quality is ‘poor’, e.g. “*after the channel condition is changed*”, and the management center decides which frequency and modulation scheme should use, based on the criteria such as ‘good’, ‘poor’, ‘mediocre’, etc. to adapt to the transmission quality by setting

Art Unit: 2661

suitable modulation methods (“*dynamic modulation profile*”; For example see Col. 3, Lines 1-7); wherein the return channel quality measurement at the head end is made by determining the signal-to-noise ratio “*SNR ratio*” and using preset thresholds, “*predetermined value*”, for creating the criterion (For example see Col. 2, Lines 1-21, 41-67).

- In regard to claims 30-33 and 63-66, **Durvaux** further discloses about the establishing a suitable modulation methods in the network terminations which can be adapted to the transmission quality of the return channel (“*dynamically configuring*”) by generating and transmitting the control signal to the attached network termination (For example see steps 8-9 in Fig. 2) for which frequency and modulation scheme should use (For example see Fig. 2; Col. 1, Lines 59-64; Col. 2, Lines 41-67); and wherein the method can be used both in a wirelines or in a radio network (“*wireless network*”; For example see Col. 2; Lines 19-21).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6-8, 10-22, 34, 39-41, 43-55, 67-70 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Durvaux et al.** (U.S.6,449,243) in view of **Needham et al.** (U.S.5,764,699).

- Regarding claims 6-8, 10-12, 39-41 and 43-45, **Durvaux** discloses all the subject matter of the claimed invention as discussed in part 3 above of this Office action, including the head end continues to process the transmission, i.e. '16 QAM' or "*first modulation profile*", if the return channel quality measurement is 'good'; or changes to the 'QPSK' ("*second modulation profile*"), if the return channel quality measurement is 'poor'. **Durvaux** also discloses about the preset thresholds ("*predetermined values*"), but fails to specifically disclose the value is "*equal to 25dB*" or in the "*range from 15dB to 25dB*". However, the selected values for the threshold, e.g. max and min values, are depended from system to system and easy to set to a specific value in the preset thresholds as system engineering choices.

Thus it would have been obvious to the person of ordinary skill in the art at the time of the invention was made to implement the specific threshold value(s) such as "*equal to 25dB*" or in the "*range from 15dB to 25dB*" in the preset thresholds as taught by **Durvaux**, with the motivation being to provide the selected value or range for the preset thresholds.

- In regard to claims 13-22, 34, 46-55 and 67, **Durvaux** further does disclose that the head end ("*head end*") connecting to a plurality of network terminations ("*cable modem*") uses suitable error-correction mechanism in order to minimize the transmission errors and noise-induced interference via the quality of the return channel decided by the management center at the head end, i.e. "*CMTS*", (For example see Col. 1, Lines 51-55), but fails to disclose about the channel condition change includes "*the change in the value of the corrupted packets via using the Forward Error Correction*". However, such implementation is known in the art.

For example, **Needham** discloses in Figs. 2-4 and in the respective portions of the specification about the system and method for providing adaptive modulation in the radio communication system (For example see Abstract); wherein the selected modulation scheme is based on the channel quality ("*channel condition change*"), e.g. the signal power to interference plus noise ratio 'S/I+N' and the calculated average block error rate ("*corrupted packets to the total number of packets received*"; For example see Col. 6, Lines 9-60) using error detection coding (For example see Col. 3, Lines 31-38), for comparing with the upper and lower error threshold values ("*predetermined value of k percent*"; For example see Col. 6, Lines 26-30) in the feedback message over the channel 106, in determining the proper modulation technique such as QAM or QPSK ("*QAM, QPSK modulation*"; For example see Col. 4, Lines 15-21) for transmission in the time division multiplexed communication channels (For example see Col. 5, Line 1 through Col. 7, Line 47). The combination of **Needham** and **Durvaux** fails to specifically disclose the use of "*FER*"; however, the forward error correction method is well known in the art for correcting error during transmission.

Thus it would have been obvious to the person of ordinary skill in the art at the time of the invention was made to implement the invention as taught by **Needham**, by combine the method of using the FEC and checking calculated average error rate in the channel quality of the **Needham**'s system into the channel quality and error-correction mechanism of the **Durvaux**'s system, with the motivation being to provide adaptive modulation schemes in respond to varying channel conditions during transmission error.

- Regarding to claims 68-70 and 73, the combination of **Needham** and **Durvaux** discloses all the subject matter of the claimed invention as discussed in parts 3 and 5 above of this Office action, including the memory element ("*computer usable medium*") of the radio unit with software and software subroutines ("*computer code and program product*") executed by the microprocessor and DSP (For example see **Needham**: Fig. 2; Col. 4, Lines 33-67) for providing adaptive modulation in the radio communication system (For example see **Needham**: Abstract); wherein the selected modulation scheme is based on the channel quality ("*channel condition change*"), e.g. the signal power to interference plus noise ratio 'S/I+N' and the calculated average block error rate using error detection coding (For example see **Needham**: Col. 3, Lines 31-38), for comparing with the upper and lower error threshold values ("*predetermined value of k percent*"; For example see **Needham**: Col. 6, Lines 26-30) in the feedback message over the channel 106 ("*first channel*"), in determining the proper modulation technique such as QAM or QPSK ("*QAM, QPSK modulation*"; For example see **Needham**: Col. 4, Lines 15-21) for transmission in the time division multiplexed communication channels (For example see **Needham**: Col. 5, Line 1 through Col. 7, Line 47); wherein the head end adapts to the transmission quality by setting suitable modulation methods ("*dynamic modulation profile*"; For example see **Durvaux**: Figs. 1-2; Col. 1, Lines 59-64) based on the determining the signal-to-noise ratio ("*SNR*") of the return channel quality measurement and using preset thresholds, "*predetermined value*", for creating the criterion (For example see **Durvaux**: Col. 2, Lines 1-21, 41-67), generates and transmits the control signal to the attached network termination (For example see steps 8-9 in Fig. 2) for which frequency and modulation scheme should use (For example see **Durvaux**: Col. 2, Lines 41-67). The combination of **Needham** and **Durvaux** fails to

Art Unit: 2661

specifically disclose the use of “*FER*”; however, the forward error correction method is well known in the art for correcting error during transmission.

Thus it would have been obvious to the person of ordinary skill in the art at the time of the invention was made to implement the invention as taught by **Needham**, by combine the method of using the FEC and checking calculated average error rate in the channel quality of the **Needham**’s system into the channel quality and error-correction mechanism of the **Durvaux**’s system, with the motivation being to provide adaptive modulation schemes in respond to varying channel conditions during transmission error.

Allowable Subject Matter

6. Claims 23-29, 56-62 and 71-72 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Schramm et al. (U.S.6,208,663), **Puc** (U.S.6,341,023), **Durvaux et al.** (EP0930743) and **Raith A. K.** (WO 97/15131) are all cited to show devices and methods for supporting multiple modulation/coding schemes in the communication architectures, which are considered pertinent to the claimed invention.

Art Unit: 2661

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tri H. Phan, whose telephone number is (703) 305-7444. The examiner can normally be reached on M-F (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W. Olms can be reached on (703) 305-4703.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office, whose telephone number is (703) 305-3900.



Tri H. Phan
November 15, 2003



DANG TON
PRIMARY EXAMINER